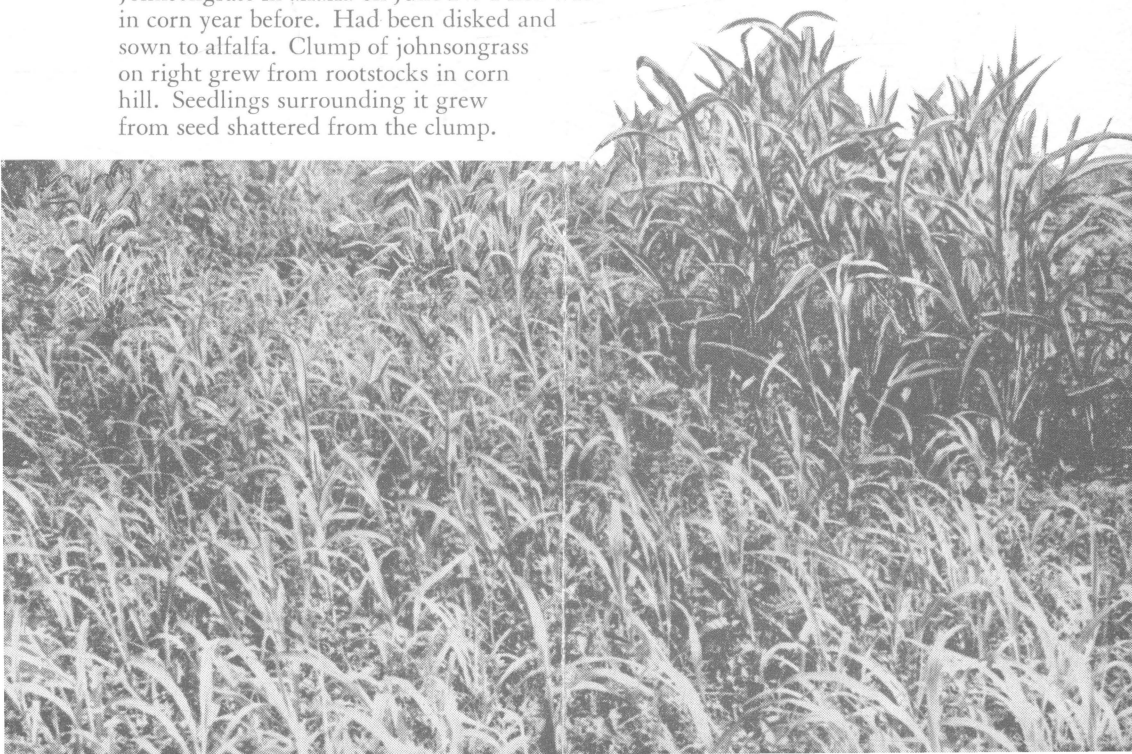
Revised June, 1956 Bulletin 342

You Can Control Johnsongrass

Agricultural Extension Service
Ohio State University
Ohio Agricultural Experiment Station

Johnsongrass in alfalfa on June 24. Field was in corn year before. Had been disked and sown to alfalfa. Clump of johnsongrass on right grew from rootstocks in corn hill. Seedlings surrounding it grew from seed shattered from the clump.



You Can Control Johnsongrass

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Cooperation of several southern Ohio county agricultural agents gratefully acknowledged.

Johnsongrass has stolen much rich bottom land from southern Ohio farmers since the 1920's. In 1937, farmers had abandoned 1,000 acres to johnsongrass in three counties, and the weed had attacked 4,000 more acres. Today many persons despair of continuing crop production in the bottoms.

You can control johnsongrass. You can't grow corn every year in johnsongrass areas, but after a clean-up you can produce corn at least half the time.

How Johnsongrass Grows

Johnsongrass spreads by seed. Common distributors of it include: low grade crop seed, floods, hay or fodder, and farm machinery. The weed will spread rapidly from scattered infestations. See cover.

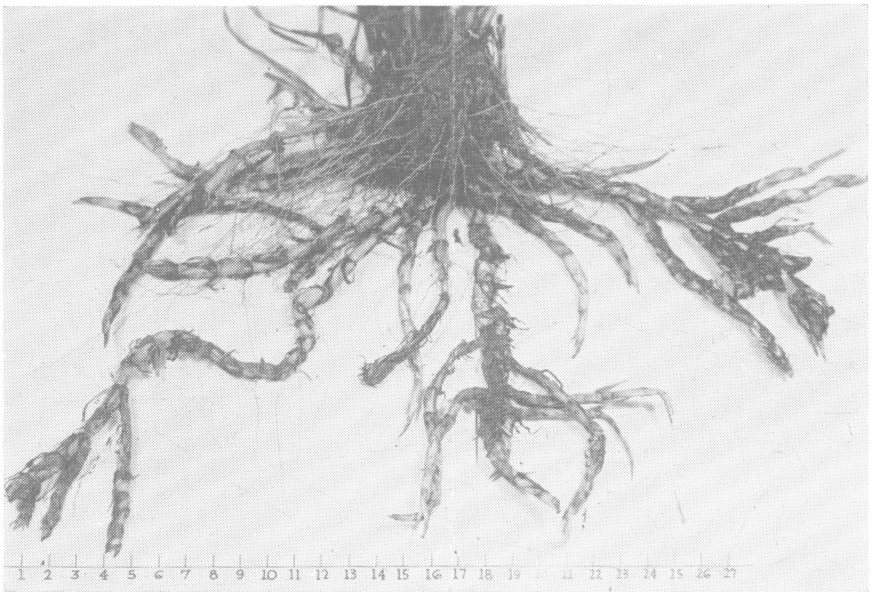
We do not know how long the seed remains alive in the soil. In tests that began in 1951, however, seeds buried in the surface soil germinated over 25 percent after 3 years' burial. Seeds buried just below plow depth germinated over 60 percent.

Once established, johnsongrass is perennial. Its heavy, vigorous rootstocks make most of their growth after July 1—after the plant is in full bloom.

If you keep the field mowed these rootstocks are much less vigorous. In fact, farmers who use johnsongrass as a crop must not overcut or overgraze it. Its response to overcutting or overgrazing is similar to that of alfalfa.

Pure stands of johnsongrass after a year's growth become "sod-bound," shorter, and yield less. Lack of nitrogen produces this "sod-bound" condition. Vigorous as johnsongrass is in the normal bottomland soils of Ohio, its growth often can be doubled by heavy applications of nitrogen fertilizers.

If you allow johnsongrass to grow uncontrolled, it will produce seed and build rootstock reserves—and so take over your field.



Johnsongrass Rootstocks

Johnsongrass starts late in the spring in Ohio. It starts from rootstocks about the middle of May and from seed just a little later. The plants from either source, therefore, start about with corn.

The first 12 to 18 inches' growth in the spring comes mainly from parent rootstocks. New rootstocks begin to develop after this growth. Regular, early cutting of johnsongrass depletes the rootstocks. On the new growth after plowing, the johnsongrass plants begin to develop rootstocks when they are 8 to 10 inches tall. Cultivation prevents production of new rootstocks.

Since they have almost the same requirements as corn, the two grow together in the corn hill or row, and nothing dislodges them. In one test in the Paint Creek bottom, corn that received normal cultivation growing in competition with johnsongrass produced 11 bushels per acre. The field could have made 80 bushels an acre with no weed competition.

Eradication Versus Control

It is easy to kill johnsongrass on land not subject to overflow. Eradication methods have been known since 1933. These methods, however, do not solve the major problem of the johnsongrass region.

Farmers on river bottoms wish to grow corn most of the time, and the bottoms are fertile and should produce good corn yields. Farmers cannot produce corn profitably, however, by usual methods on johnsongrass-infested land. On bottoms subject to flooding farmers can control johnsongrass, but few can expect to eradicate it by present methods when floods continually bring in the weed seed.

Steps in Eradication

1. **Cut for hay or pasture heavily until late June**—Pasturing johnsongrass is ideal if you can fence the area. Electric fence will help. Keep growth short. Allow none of the plants to get above 12 inches tall.

2. **Plow in June**—Be sure to turn all top growth completely under. Plow when the tallest plants are 12 to 18 inches tall, if they have not been pastured or mowed.

3. **Work the ground** thoroughly every 2 weeks until about September 15. After you plow, cultivate the field every time the johnsongrass grows 6 to 8 inches tall. Use a 22 to 24-inch double disc, a field cultivator, or any tool which will destroy top growth completely. This will require five or six cultivations during the summer unless recovery is reduced by drouth.

4. **Sow winter barley.** Fertilize it well. Winter barley is better than wheat, because you usually can combine barley the following year before johnsongrass is tall enough to interfere with harvest. Bottom land often needs a cover crop.

5. **Plow as soon as you harvest the barley** the second year. Work the ground through July and August. Sow barley again as a cover crop preparing for corn the following year.

These five steps will finish all but occasional stragglers of johnsongrass. If they appear, these should be killed with chemicals with little loss of crop.

You may vary this basic method to fit the crop you want in the field. Essential items are: 1. close pasturing or mowing through June; 2. plowing and working, and 3. sowing barley either for harvest or winter cover crop.

Johnsongrass in Corn

Controlling Johnsongrass

Johnsongrass control must include control of plants from rootstocks and from seed. Seedlings are almost as serious in corn as plants that live over winter. For the first few weeks, cultivation kills them. At 4 to 6 weeks, however, they form rootstocks from which sprouts can start.

Steps 1, 2, and 3 in control are the same as in eradication. **In step 4, sow barley, wheat, or a mixture of rye** (60 lb./A) and inoculated hairy vetch (20 lb./A). The rye-vetch mixture may be best.

Plow the crop under May 15-25 for corn. The late plowing will reduce the vigor of the johnsongrass further and will release more nitrogen from the vetch.

Cover the vetch completely. It can be as bad as cockle in wheat.

Using this method, you can—at the very least—grow one corn crop in 2 years with ordinary cultivation. Checking the corn is advisable and at times necessary. In a badly polluted field, you may need 2 years of clean-up before you start alternate-year corn production. There will be a few weakened rootstocks and no fresh seed in the soil because of the mowing and cultivating the year before. Preven-

tion of seed production is almost as important as the weakening of rootstocks.

You may repeat summer fallow the year following the corn crop. With help from herbicides you may grow a second year of corn before repeating the fallow.

This plan will permit corn either every other year or twice in 3 years, which is certainly preferable to abandoning the land to johnsongrass.

Heavy pasturing or mowing all year at 12 to 18 inches in height—until frost—followed by plowing, without working down so the land lies rough during winter, will reduce johnsongrass enough in some cases to permit a crop of corn the next year.

Late Plowing To Control Johnsongrass

During the past 5 years, several experiments in which johnsongrass was **plowed late** have shown almost equal johnsongrass control on untreated plots and chemically treated plots. Very little johnsongrass survived in untreated plots.

In most such instances the experimenter also reworked the soil after one crop of johnsongrass had started. The extra working killed one crop of seedlings and further retarded the johnsongrass. This permitted a late crop of corn on the land. Some farmers also report they control johnsongrass by late plowing and soil preparation and late corn planting.

You may plow after johnsongrass is 12 to 15 inches high—probably after June 1—or you may plow in April, work the soil in mid-May and rework it June 1 before you plant corn.

Working soil late in the spring destroys the first johnsongrass sprouts and depletes the rootstocks which recover slowly. Late seedbed preparation destroys one crop of seedlings in the surface soil.

Corn planted in June usually will not yield as well as that planted a month earlier on clean land. However, a Ross County field, a test site in 1955, was planted on June 6 and yielded 95 bushels per acre. It was relatively free of johnsongrass.

Herbicides on Johnsongrass

Herbicides such as 2,4-D, 2,4,5-T and MCP will not kill or control emerged johnsongrass or johnsongrass rootstocks. Several tests

of 2,4-D pre-emergence treatments show partial control of seedlings. Such treatments are subject to the usual hazards of 2,4-D pre-emergence, in that there is hazard to the corn in an unusually wet season, and no effect on the johnsongrass if it is dry from the time of application until after the johnsongrass is established.

Ohio agronomists have tested sodium chlorate and sodium trichloracetate (TCA). These herbicides cost too much for overall field treatment. Either chemical will eradicate small patches in a field—especially on areas not subject to overflow.

Two to three ounces of sodium chlorate put on dry by hand will kill johnsongrass growing in an occasional hill of corn, after the summer-fallow method. It also will kill the corn but johnsongrass would have crowded out the corn anyway.

Chlorate may present a fire hazard but this should not prevent its use. When you use chlorates and chlorate mixtures:

Buy chlorates and chlorate mixtures in the manufacturer's original drums. Store them in these containers in a detached outbuilding.

Use metal containers for chlorates and chlorate solutions. Do not spill the dry chlorates or the solution on floors, wagon beds, or anything burnable.

Wear rubber boots when you apply chlorates. Do not smoke or come near any fire.

Remove chlorates from utensils or equipment at once after making applications. Wash thoroughly, or destroy at once, clothing or cloths which have been soaked with the chlorate solutions, or filled with dry chlorates.

Until after a heavy rain, chlorate-treated areas are a fire hazard both from spontaneous and accidental ignition. See that an accidental "burning-off" of such an area cannot spread to building or dry crops.

TCA is not a fire hazard, and it is more soluble in water than sodium chlorate. This makes TCA easier to apply as a spray. It also is effective at lower doses. TCA decomposes in the soil more rapidly than chlorate, and so it does not sterilize the soil so long.

You usually should apply chlorate dry. It costs less than TCA. It does not burn the skin and is less corrosive to equipment than TCA.

Dalapon (sodium 2,2-dichloropropionate) has produced good results on young, vigorous-growing johnsongrass, but we lack the experience to define its best use. Fall applications seem to be the best in Ohio. Spring applications of dalapon on johnsongrass preceding corn have been unsatisfactory. Corn planting must be delayed until after June 1, and the corn is likely to be injured.

Successful dalapon use depends upon application to young, rapid-growing johsongrass. You may stimulate this rapid growth in meadows and small grain fields by clipping in early September. This is impossible on continuous corn land.

Ten to 20 pounds of active dalapon in 40 gallons of water per acre is probably the best rate. **Plow** the ground 5 to 10 days after you apply the spray. Leave the field rough.

Dalapon acts on plants like an anesthetic does on a human. On johnsongrass, it causes a dormant effect for about 6 weeks. Experimental work shows that disturbing the roots while the weed is in this state is much more effective than leaving it undisturbed.

Don't play fair with johnsongrass. Hit it while it is down!

9/56—2.5M

The Ohio State University and the U.S. Department of Agriculture cooperating
Agricultural Extension Service, W. B. Wood, director, Columbus, Ohio
Printed and distributed in furtherance of acts of May 8 and June 30, 1914